

Program Analysis Report No. 16
Planning and Analysis Section
Rural Rehabilitation Division
Reserve

March 4, 1941

~~CONFIDENTIAL~~

GRANTS TO RURAL REHABILITATION BORROWERS

Fifty-eight percent, or 240,492 of the 411,337 active standard borrowers on June 30, 1940, had received one or more Farm Security Administration grant payments. The average amount of grants received by these 240,492 borrowers was \$97; calculated as an average for all borrowers, the average amount of grant payments was \$57, (Table 1.)

Table 1. Number of Active Standard RR Borrowers June 30, 1940, Number and Proportion of Such Borrowers That Have Received Grants June 30, 1940; Average Amount of Grant Payments to Active Standard Borrowers per Borrower for All Borrowers; and Average per Borrower for Those That Received Grants, by Region

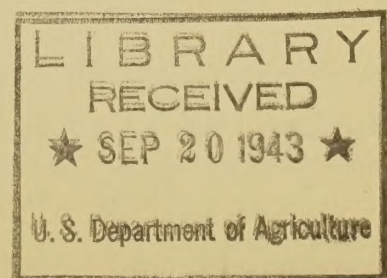
A	B	C	D	E	F	G
		:Active standard RR Bor-		: Amount of grant payments		
		:rowers that had rec'd		: to active standard		
	:Active standard	:grants June 30, 1940		: RR borrowers		
Region	: RR borrowers	:Proportion of		:Average per	:Average per	
	:June 30, 1940 $\frac{1}{2}$:Total $\frac{1}{2}$: all active	: Total	:borrower	:borrower for
		: standard	: amount $\frac{2}{3}$:for all bor-	:those that	
		: borrowers		:rowers $\frac{2}{3}$:rec'd grants	
	: Number	:Number	: Percent	: 1,000	: Dollars	: Dollars
				: dollars		
United						
States	: 411,337	: 240,492	: 58	: 23,446	: 57	: 97
I	: 13,846	: 5,078	: 37	: 526	: 38	: 104
II	: 24,938	: 12,221	: 49	: 1,870	: 75	: 153
III	: 63,418	: 24,511	: 39	: 1,839	: 29	: 75
IV	: 55,697	: 22,732	: 41	: 1,114	: 20	: 49
V	: 79,042	: 57,327	: 73	: 2,925	: 37	: 51
VI	: 52,365	: 39,722	: 76	: 1,204	: 23	: 30
VEI	: 31,621	: 25,230	: 80	: 8,063	: 255	: 320
VIII	: 45,875	: 31,006	: 68	: 2,294	: 50	: 74
IX	: 10,649	: 5,507	: 52	: 426	: 40	: 77
X	: 10,230	: 6,195	: 61	: 1,187	: 116	: 192
XI	: 12,171	: 4,668	: 38	: 389	: 32	: 83
XII	: 11,085	: 6,053	: 55	: 1,330	: 120	: 220

1/ Source: FSA Report No. 7, "Monthly Report of FSA Cases", June 30, 1940.

2/ Calculated from data available from County Supervisors' 1939 Report of Family Progress of RR Borrowers.

3/ $F = E \div B$

4/ $G = E \div C$



The purpose of this analysis is to determine the relationship, if any, between the economic status of active standard RR borrowers and the amount of FSA grant funds they receive. The result of the analysis should throw some light on such operating and policy problems as uniformity in the application of FSA grant policy, the use of grants in lieu of farm debt adjustment, and the use of grants to repay loans.

To have a basis for comparison, it can be said that the amount of family income (gross family income - cash farm operating expenses) plus the amount of grant funds extended should be more or less uniform from borrower to borrower and from region to region. For example, if borrowers with an average annual family income of \$750 receive an average of \$20 in grants per year; then, in accordance with this base, borrowers with an average annual family income of \$500 would receive grants in the amount of \$270 per year; that is $\$750 \text{ plus } \$20 = \$770 = \$500 + \$270$. Using the same assumptions, a borrower with an annual family income of only \$250 would receive grants in the amount of \$520 each year. To carry farther this idea of a base for testing the rural rehabilitation grant record, a figure representing the approximate minimum family income required to provide the minimum physical and cultural requirements for farm living may be taken as the constant or uniform total referred to above. The application of this base for each of the several FSA regions is indicated in Table 2. 1/

Table 2. Average Amount of Grant Funds Per Family Required Annually to Build up Family Income to an Assumed Minimum Desirable Amount, by Region

A	B	C	D	E	F
Region	Estimated value of minimum physical and cultural requirements	Average annual amount of grant funds required for families with annual family incomes of:			
		Negative income	0 to \$499	\$500 to 999	\$1000 or more
United States	800	900	550	50	0
I	820	920	570	70	0
II	820	920	570	70	0
III	820	920	570	70	0
IV	705	805	455	0	0
V	705	805	455	0	0
VI	705	805	455	0	0
VII	820	920	570	70	0
VIII	705	805	455	0	0
IX	895	945	595	95	0
X	845	945	595	95	0
XI	845	945	595	95	0
XII	845	945	595	95	0

1/ The figure used for each major section of the country is based upon estimates in James G. Maddox' "Suggestions for a National Program of Rural Rehabilitation and Relief", Journal of Farm Economics, 21:4: (November, 1939).

The purpose of this analysis is to determine the relationship between the amount of rainfall and the amount of crop yield. The results of the analysis should show some light on the relationship between the two variables. The analysis is based on the data collected for the year 1950.

To find a linear relationship, it was assumed that the amount of rainfall (in inches) and the amount of crop yield (in bushels) are linearly related. The data was then plotted on a graph with rainfall on the x-axis and crop yield on the y-axis. The resulting line of best fit is shown in the figure. The equation of the line is $y = 0.0001x + 0.0001$. This equation indicates that for every inch of rainfall, the crop yield increases by 0.0001 bushels. The correlation coefficient is 0.99, indicating a very strong positive linear relationship between the two variables.

Table 2. Summary of results of the linear regression analysis. The table shows the equation of the line, the correlation coefficient, and the standard error of the estimate.

Year	Rainfall (inches)	Crop Yield (bushels)
1950	10.0	0.0001
1951	11.0	0.0001
1952	12.0	0.0001
1953	13.0	0.0001
1954	14.0	0.0001
1955	15.0	0.0001
1956	16.0	0.0001
1957	17.0	0.0001
1958	18.0	0.0001
1959	19.0	0.0001
1960	20.0	0.0001
1961	21.0	0.0001
1962	22.0	0.0001
1963	23.0	0.0001
1964	24.0	0.0001
1965	25.0	0.0001
1966	26.0	0.0001
1967	27.0	0.0001
1968	28.0	0.0001
1969	29.0	0.0001
1970	30.0	0.0001

The data shows a clear positive linear relationship between rainfall and crop yield. The equation of the line is $y = 0.0001x + 0.0001$. This equation indicates that for every inch of rainfall, the crop yield increases by 0.0001 bushels. The correlation coefficient is 0.99, indicating a very strong positive linear relationship between the two variables.

In accordance with this scheme a family in Region X with an annual family income (gross income minus cash farm operating expenses) of \$1000 would receive no grant funds, while a family with an annual family income of from zero to \$500, whose average income is \$250, would receive grant funds in the average amount of \$595 per year, since \$250 plus \$595 equals \$845, the assumed minimum income required to provide a minimum physical and cultural standard of living in the region.

Table 3 indicates the proportional distribution of active standard RR borrowers among the various family income classes used in Table 2. Approximately 5 percent of all active standard RR borrower families had incomes during the year before acceptance of \$1000 or more; another 21 percent had incomes during the year before acceptance of from \$500 to \$999. Seventy percent of the families had before acceptance net incomes between zero and \$499; while approximately one family out of 25 had negative before acceptance incomes.

Before acceptance net income is not, of course, a completely satisfactory measure of borrowers' relative economic status during the years they have been RR borrowers; it is, however, the most reliable single index available from the County Supervisors' 1939 Report of Family Progress. Using this figure, active standard RR borrowers in each region were classified into five income groups. The amount of grant payments received by the families in each of these groups was then summarized and an average calculated by dividing the amount of grant funds received by the number of borrowers in each group.

Table 3. (U. S.) Proportional Distribution of Active Standard Rural Rehabilitation Borrowers, by Class Interval Groups of Net Income Year Before Acceptance and by Region, United States 1/

A	B	C	D	E	F
	: Proportion of all borrowers with net incomes year before acceptance of:				
Region	: All	: Negative	: 0 to \$499	: \$500 to 999	: \$1000 or more
	: borrowers	: income			
	: Percent	: Percent	: Percent	: Percent	: Percent
United States	: 100.0	: 4.2	: 69.8	: 20.9	: 5.1
I	: 100.0	: 6.6	: 39.9	: 36.6	: 16.9
II	: 100.0	: 2.3	: 60.7	: 31.4	: 5.6
III	: 100.0	: 1.2	: 62.6	: 30.3	: 5.9
IV	: 100.0	: 1.5	: 59.3	: 33.7	: 5.5
V	: 100.0	: 5.9	: 89.2	: 4.2	: .7
VI	: 100.0	: .9	: 90.1	: 8.5	: .5
VII	: 100.0	: 10.4	: 69.6	: 16.7	: 3.3
VIII	: 100.0	: 5.4	: 79.6	: 11.8	: 3.2
IX	: 100.0	: 2.1	: 34.9	: 40.9	: 22.1
X	: 100.0	: 9.4	: 47.3	: 27.9	: 15.4
XI	: 100.0	: 4.1	: 33.5	: 40.2	: 22.2
XII	: 100.0	: 13.4	: 62.9	: 19.1	: 4.6

1/ Based on County Supervisors' 1939 Report of the Family Progress of Active Standard Rural Rehabilitation Borrowers.

to determine the effect of this treatment on the growth of the plants. The results of the experiment are shown in Table I. The plants treated with the hormone showed a significant increase in growth compared to the control plants.

Table I shows the effect of the hormone on the growth of the plants. The plants treated with the hormone showed a significant increase in growth compared to the control plants. The results of the experiment are shown in Table I.

The results of the experiment are shown in Table I. The plants treated with the hormone showed a significant increase in growth compared to the control plants. The results of the experiment are shown in Table I.

Table I. Effect of the hormone on the growth of the plants. The results of the experiment are shown in Table I.

Plant	Control	Hormone
1	10.0	12.5
2	11.0	13.0
3	12.0	14.0
4	13.0	15.0
5	14.0	16.0
6	15.0	17.0
7	16.0	18.0
8	17.0	19.0
9	18.0	20.0
10	19.0	21.0
11	20.0	22.0
12	21.0	23.0
13	22.0	24.0
14	23.0	25.0
15	24.0	26.0
16	25.0	27.0
17	26.0	28.0
18	27.0	29.0
19	28.0	30.0
20	29.0	31.0
21	30.0	32.0
22	31.0	33.0
23	32.0	34.0
24	33.0	35.0
25	34.0	36.0
26	35.0	37.0
27	36.0	38.0
28	37.0	39.0
29	38.0	40.0
30	39.0	41.0
31	40.0	42.0
32	41.0	43.0
33	42.0	44.0
34	43.0	45.0
35	44.0	46.0
36	45.0	47.0
37	46.0	48.0
38	47.0	49.0
39	48.0	50.0
40	49.0	51.0
41	50.0	52.0
42	51.0	53.0
43	52.0	54.0
44	53.0	55.0
45	54.0	56.0
46	55.0	57.0
47	56.0	58.0
48	57.0	59.0
49	58.0	60.0
50	59.0	61.0
51	60.0	62.0
52	61.0	63.0
53	62.0	64.0
54	63.0	65.0
55	64.0	66.0
56	65.0	67.0
57	66.0	68.0
58	67.0	69.0
59	68.0	70.0
60	69.0	71.0
61	70.0	72.0
62	71.0	73.0
63	72.0	74.0
64	73.0	75.0
65	74.0	76.0
66	75.0	77.0
67	76.0	78.0
68	77.0	79.0
69	78.0	80.0
70	79.0	81.0
71	80.0	82.0
72	81.0	83.0
73	82.0	84.0
74	83.0	85.0
75	84.0	86.0
76	85.0	87.0
77	86.0	88.0
78	87.0	89.0
79	88.0	90.0
80	89.0	91.0
81	90.0	92.0
82	91.0	93.0
83	92.0	94.0
84	93.0	95.0
85	94.0	96.0
86	95.0	97.0
87	96.0	98.0
88	97.0	99.0
89	98.0	100.0
90	99.0	101.0
91	100.0	102.0
92	101.0	103.0
93	102.0	104.0
94	103.0	105.0
95	104.0	106.0
96	105.0	107.0
97	106.0	108.0
98	107.0	109.0
99	108.0	110.0
100	109.0	111.0

The results of the experiment are shown in Table I. The plants treated with the hormone showed a significant increase in growth compared to the control plants. The results of the experiment are shown in Table I.

The results of this operation are indicated in Table 4. Attention should be called to the fact that each of the averages in Table 4 is the average amount of grant funds received per borrower for all borrowers; that is, the figures are not comparable to those in Column G, Table 1.

Table 4. Average Amount of Grants Made to Active Standard RR Borrowers Grouped in Class Intervals According to Net Incomes in Year before Acceptance, by Region 1/

A	B	C	D	E	F
Region	All borrowers	Average amount of grants received by active standard RR borrowers with net incomes in year before acceptance of:			
		Negative	00 - \$499	\$500 - 999	\$1,000 or more
United States	57	127	60	42	27
I	38	39	45	37	25
II	75	116	85	61	26
III	29	39	38	14	6
IV	20	13	23	17	10
V	37	43	37	27	18
VI	23	23	24	18	16
VII	255	366	255	205	159
VIII	50	52	53	36	19
IX	40	35	51	43	17
X	116	151	139	99	53
XI	32	46	40	30	20
XII	120	167	126	80	67

1/ Based on County Supervisors' 1939 Report of the Family Progress of Active Standard Borrowers.

The figures in Table 4 indicate that, within regions, there has been but a slight relationship between the before acceptance economic status of the borrower families and the amount of grants received after acceptance. A comparison of Table 3 with Table 1 will indicate the extent to which the grant record in a region fails to approach the idealized test basis postulated on the use of grants to build up a uniform amount of funds available for family living. Moreover, it should be pointed out that the figures shown in Table IV indicate the average amounts of grants received over an average period of 2½ to 3 years since acceptance on the RR program, while those shown in Table II, indicate annual requirements for grant funds.

In accordance with the test basis postulated in Table 2, borrowers with negative family incomes should receive approximately \$900 in grant funds, families with incomes falling in the zero to \$499 group should receive annually an average of approximately \$550 in grants; while those in the \$500 to \$999 group should receive approximately \$50, with those with \$1000 or more income receiving no grant funds. Compared with these idealized amounts, the actual record indicates that the poorest borrowers, those with negative incomes, received a total amount of only \$127 over an average period of approximately 3 years, while borrowers in the \$1000 or more group received an average of \$27. The two intermediate groups received \$60 and \$42 respectively. In general, this same relationship holds within each of the Farm Security Administration regions; that is, the borrowers with the lower incomes

received less grants than that indicated in the idealized scheme shown in Table 2, while borrowers with \$1000 or more received grants in a greater amount than that shown.

Another lack of correspondence is indicated as between regions. In Regions VII, X and XII, the highest income borrowers, those with \$1000 or more net incomes, received \$159, \$53 and \$67, respectively; while the poorest borrowers, those with negative incomes, in Regions IV and VI, received less than \$30 in grants. Borrowers in Region VII, irrespective of economic status, have received by far more grant funds than have borrowers in any other region. Regions II, X, and XII have also been more liberal with grants to RR borrowers than the U. S. average. These regions have also given larger relative amounts of grants to high income borrowers. (Table 4), and, with the exception of Region XII, they are also the regions (Table 3) which have made loans to a relatively large number of families with incomes of more than \$1000.

